

Monday 9 July 2018

## Is agriculture ready for autonomy?

Autonomous and robotic applications are expanding rapidly into agriculture. From partial autonomy of complex machinery operations to fully autonomous monitoring and application using machine learning and artificial intelligence (AI), new uses of technology for agriculture are emerging almost on a daily basis. The new edition of the Australian Farm Institute's *Farm Policy Journal* looks at a range of issues relating to the adoption and use of robotics and autonomous systems in agriculture.

"These systems are not unique to agriculture, and indeed other sectors with more advanced autonomy are both pointing to potential uses of the technology while also providing signals about complexity of regulation and social acceptance," said AFI Executive Director Richard Heath.

Articles included in the Winter 2018 Journal are:

- **'The Future of Autonomous Dairies'**, by Nicolas Lyons, NSW Department of Primary Industries, and Cameron Clark, The University of Sydney
- **'FarmBeats: Automating Data Aggregation'**, by Ranveer Chandra, Microsoft Research
- **'Agricultural Robotics – What Can Go Wrong?'**, by Tristan Perez, Queensland University of Technology
- **'Legal Consequences of Autonomous Farming'**, by Leanne Wiseman, Griffith University, Tina Cockburn, Queensland University of Technology, and Jay Sanderson, University of the Sunshine Coast
- **'Cognitive Factors that Affect the Adoption of Autonomous Agriculture'**, by S Kate Devitt, Queensland University of Technology

"These papers collectively provide a positive outlook for the potential of autonomous systems in agriculture," Mr Heath said.

"An interesting common view of all the authors is that the information and knowledge derived from those systems will be one of the most significant benefits of robotics and autonomy - as much or perhaps even more so than the actions that are performed."

Digital agriculture offers one of the most promising approaches to address the challenge of sustainably increasing food production by 70% by 2050 (from 2010 production levels). Using the latest advances in AI and machine learning, farmers can be empowered with predictions that can improve farm processes, from planning until harvest. Satellite data and remote sensing techniques can provide agricultural insights, by using advanced image processing algorithms and AI algorithms on multiple spectral bands in satellite imagery to estimate crop health.

Yet while robotic and autonomous agricultural technologies are increasingly available, they still may fail to be adopted. Cognitive barriers to adoption may include: inability to generate trust, loss of farming knowledge and reduced social cognition. In addition, the potential legal consequences of the introduction of autonomous machines and technologies into Australian agriculture must be considered. As autonomous and robotic equipment use increases, so too will the rate of incidents or accidents involving such equipment.

*(continued over page)*

**Monday 9 July 2018**

## **Is agriculture ready for autonomy? (continued)**

“There are clearly many developing and complex issues to deal with before the widespread adoption of autonomous systems on-farm is achieved,” said Mr Heath. With food security high on the world’s agenda, attention is being drawn to the power of new digital and autonomous technologies to increase agricultural productivity. Several useful assessment frameworks and methodologies are proposed in the papers in this journal to assist with the ongoing development of autonomous agricultural technology.

“The robots are indeed coming,” said Mr Heath, “and the ideas and recommendations contained in this journal will ensure that they are coming to help.”

*Ends*

[www.farminstitute.org.au](http://www.farminstitute.org.au)

*Media contact, Richard Heath: 02 9690 1388 or 0427 447 872*